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SOCIETY OF ARTS.

FRIDAY, DECEMBER 31st, 1852.

HAVING completed in the present Number the publication of the List of Subjects selected for Premiums during the present Session, it is confidently hoped that the invitation thus held out will be warmly responded to, by all who feel themselves capable of solving the difficulties, supplying the wants, and affording the information so suggested, or called for, by the Society. A hasty view of the field of invention and discovery can alone have originated that most mistaken but very general impression, which regards the different steps in the progress of the Arts as accidental, and made without much reference to the exigencies and necessities of life as they arise. Men talk of the great improvements which have been achieved in the processes of production, as if they mainly depended upon individual ingenuity developed by a happy chance, or unusual advantages of education; as if there was no natural law of progress illustrated therein, and as if the wants of mankind did not guide the labour of their hands. This Society by its constitution and objects holds a different faith. It believes in the regular sequence of Inventions, in the certainty with which the supply of discovery follows the demand for it, and in the vast importance of knowing and appreciating what our specific requirements are in each department of industry. The circulation of that knowledge renders the combined ingenuity of all classes of the community available for each branch of production, and brings to bear upon any point in the material world where a difficulty arises, the experience and the resources of the whole. So complicated and interwoven with each other have the multifarious arts of life become, that assistance in one often comes from the most unexpected quarters; and this Society finds no more useful scope for its labours than in carefully collecting each year a list of subjects which shall comprehend those wants, to the supply of which the minds of our practical men are most strenuously directed. It has at all times enjoyed peculiar facilities for doing so; but never in such abundance as now. An association of the kind necessarily comprises members eminent in every department of industry, and each willingly contributes his experience of what is most required in his line of occupation. That has always been the case, and by such aids the Society has, during the long period of a century, untiringly laboured to let all classes know the material requirements of

each. But it had to struggle with many difficulties. No information of a comprehensive character existed on the useful arts. They had no literature, no philosophy, no countenance from our schools; and little but injudicious and hurtful interference from our statesmen. Men were learned in the specialities of production, but beyond them they knew little or nothing; and it has been reserved for the present day to discover as a popular fact the profound interest and charm which lie in the general study of that most varied and wonderful artificial system, which through the lapse of ages the industry of men has been slowly, laboriously, and humbly maturing. It is by Exhibitions—but more especially by the Great Exhibition of last year—that this discovery has at length been fully made, and its fruits, already visible in every direction, appear nowhere more conspicuous than in the increased facilities for usefulness thus afforded to this Society. The list of subjects for premiums is no longer a dubiously compiled document, put together on a very imperfect conception of the progress of the industrial world, and interesting only to the few. It is founded on a comprehensive survey of the whole field of human labour condensed into one view, for that among other purposes. By one effort we evoked the very Spirit of Industry, and compelled her to recount to us her wants. Men eminent in each branch of production investigated and sat in judgment upon the progress and requirements of their several specialities; and the whole results of their inquiries has been at length concentrated in one volume of Reports, which, whatever its defects in other respects, is the first comprehensive authority on the details of the artificial world. The importance of nearly all the subjects comprised in this list, renders any system of rewards in connection with it a matter of very secondary consequence; for where the urgent necessities of the day are continually pressing on men's minds the conviction that some new mode of accomplishing any given object must be discovered, no distinctions within the power of this Society to confer can increase the natural stimulus to exertion. The Society, however, can and does achieve a work of vast public value, in collecting and circulating a copious record of the desiderata of Industry; and in providing an unobjectionable ordeal wherein the follies or failures of Inventors may be criticised and corrected.

EXHIBITION OF RECENT SPECIMENS OF PHOTOGRAPHY.

In the last week's Number we promised to give a more detailed notice of the Photographic pictures, now being exhibited in the House of the

Society. Before passing them in critical review, it will perhaps be desirable for the sake of the general reader, to state shortly the principles upon which these pictures are produced, and the several modes in which those principles are applied.

The extent and the limits of the action of light upon material substances exposed to its influence, is as yet only partially explored: we know enough to suspect that it is almost universal. Its influence is shown in various ways,—sometimes in the change of relative position, which it produces among the component particles of one mass,—sometimes in the alteration of their chemical condition. Its action in both these modes may become apparent to the eye by a contemporaneous change in colour, or may remain unseen until the application of other agents makes its existence evident. The salts of silver, and among them especially the nitrate of silver, are conspicuous for the sensitiveness which they display to the action of light; but more readily affected than any single salt of silver is the companionship of some other one with the nitrate. The change that appears to take place in the nature of two such minutely-divided salts, placed in intimate contact, is a precipitation of their metallic base, and a separation of the oxygen contained in the acids previously combined with it. In some of the arrangements, by which the nitrate is placed by the side of other salts of silver, the action of light will of itself entirely separate the metal and precipitate it in a pure state. In others it will only commence an action, which it requires other agents to complete.

For the production of pictures in the camera those salts of silver are generally chosen which are affected by the light in the manner last described. The reason is, that upon them the change, which may be afterwards developed to a greater extent, is produced by a very short exposure to the rays of light. In applying these principles to picture taking, the method usually employed is to precipitate iodide of silver upon the surface of smooth paper, which may be done in various ways, and to wash the paper, now said to be iodized, with a weak solution of nitrate of silver. The paper thus rendered sensitive to light, is placed in a camera provided with a lens, which throws up on its prepared surface a refracted image of the external objects in front of the lens. When the light is supposed to have produced a sufficient effect, the paper is washed with a solution of gallic acid, which continues the deoxidation, and combining with the silver set free, forms a black deposit—gallate of silver,—varying in intensity on each part of the paper, according to the quantity of light to which that part was exposed. It will then be seen that the sky, if it be a landscape that was before the lens, will be the darkest part of the picture. When the picture has been sufficiently developed, has been fixed by immersion in hypo-sulphate of soda, and properly washed, it then forms what is called the negative.

Pictures thus obtained are said to be produced by the ordinary Talbotype paper process. There are three other modifications of this method in general use, known by the names of the Wax paper, Albumen (both on glass and

on paper), and the Collodion processes. The principle is the same in all. The difference consists either in the adoption of another material to contain the salts of silver, or in a different preparation of the same material. For example: in the wax paper process the material originally employed—paper, is saturated with wax before being iodized, with the view of obtaining an even and glossy surface, and, consequently, a more highly-defined image. It is with the same view that glass is made use of, and as it would not of itself retain in adhesion to it a coating of iodide of silver, it is first covered with a uniform layer of albumen, which will receive and retain the required salts of silver, and, when coagulated, is little affected by water; or the glass is covered with a film of gun-cotton, dissolved in ether, which, as the ether evaporates, forms a delicate and even surface, capable of receiving an impression equal in distinctness, and superior in gradation of tone, to those taken from albumen, with the additional advantage, owing, it is believed, to a yet unexplained action of the vapour of ether, of much greater sensitiveness to the action of light.

A picture obtained by any of these methods forms a kind of plate, from which, by laying it upon a piece of paper prepared by a modification of the same process, and allowing the rays of the sun to pass through it, there results an image of which the lights and shades correspond exactly with those of the original object placed in the first instance before the lens.

In the collection now exhibited in the rooms of the Society, there are excellent specimens of the capabilities of each method. The majority, and some of the very best, have been produced by the Talbotype paper process. For vigour of effect and general truthfulness, nothing can surpass the series of six pictures, exhibited by Mr. B. Turner, commencing with No. 175 in the Catalogue. Those who were assiduous attendants of the Crystal Palace will remember well the "Old Cottage," of Mr. Bingham. There are some pictures, contributed by Mr. Talbot, which are especially interesting as specimens of the perfection which was attained almost at the birth of the art. Two of them, Nos. 162 and 208, are placed in juxtaposition with pictures produced by Mr. Fenton and Mr. Delamotte, on wax paper and collodion respectively, and those who are curious enough to compare them closely will see that, if progress has been made, it is not so much in the perfection of the result, as in easier and surer modes of obtaining it. Remarkable for their delicacy and transparent atmospheric distance, are the works of Mr. Buckle and Mr. Rosling. In No. 246, "The Quadrangle of Arundel Castle," there is a bas relief, which, for the beauty of the half-tones, is scarcely surpassed by Mr. Delamotte's collodion picture on the right.

There are a great number of pictures, which, though deficient in excellence of execution, are exceedingly interesting from the judicious selection of their subject. To this class belong most of the contributions of Mr. Sherlock. So diligent a photographer as he has shown himself to be, deserves to have a better lens, or should have patience to make use of a smaller aperture. The same praise, as to choice of subject, must be

awarded to Mr. Cocke and Mr. Shaw, especially to the latter, who, in his forest scenes, has successfully sought for the most agreeable combination of lines, and the most effective distribution of light and shade, which his subject could be made to present. Photographers will look with especial interest upon the picture of the interior of Redcliff Church, by Mr. Owen. Interiors are the stumbling-block of the photographic art. To have attempted them was a bold thing; to have succeeded is, therefore, so much the more a matter of congratulation.

The readers of the *ATHENÆUM* will feel some curiosity in examining Nos. 177 and 180, contributed by Mr. Stewart. They are remarkable for the perfection of their aerial perspective; but, though the distance is beautiful, the foregrounds and dark parts are not sufficiently made out. Some interesting pictures are sent by Mr. Jones and by Sir W. Newton. Those of the latter are worthy of notice, both from the goodness of the negative picture, and on account of the method on which they are printed.

Of pictures produced by the wax paper process, Mr. Fenton is the principal contributor. This process has as yet been too little experimented upon by practised photographers in England for any satisfactory opinion to be given as to its claim to superiority.

Of the use of albumen upon glass there are no examples by English artists. The few specimens that the Exhibition contains are the work of M. Ferrier, and most beautiful they are. Albumen upon paper has been very successfully employed by Mr. Goodeve, in Nos. 154 and 216. The same gentleman is also equally happy in the use of collodion. Most of the English glass pictures have been taken by this last method. Among the best of these are the landscapes and still life subjects of Mr. Delamotte; the portraits of Mr. Berger, especially one of that veteran photographer, Mr. Fry, No. 251; the portraits of Mr. Goodeve, and a remarkable collection of positive pictures on glass, the portraits of insane persons, taken by Dr. Diamond. There is a considerable number of photographs contributed by foreign artists. Some of these are interesting from their subjects, and attract attention from their size; but the great majority of those which are printed from paper negatives are opaque in the shadows, and without gradation of tones. The best of them are the Nubian Views, and these are the more interesting from the recollection of the difficulties under which they must have been executed.

The Views of Vienna, taken by Mr. Pretch, with a lens of Ross's, show great skill in manipulation.

The pictures upon collodion sent by foreign artists are by no means numerous, but it would be difficult to equal, and almost impossible to surpass them. They are the work of M. Constant, being principally views of Rome, and are much superior to the larger pictures, from albumenised glass negatives, contributed by Mr. Owen Jones.

We have taken a pretty comprehensive survey of the Photographic Exhibition; but there is one part of it to which no allusion has as yet been made. We refer to the series of pictures taken at the Great Exhibition for the Royal Commissioners. With the exception of those by

Mr. Owen, they can scarcely be considered so meritorious as many others in the collection, to which we have previously referred.

At the *soirée* on the 22nd inst., in proposing a vote of thanks to Mr. Fenton, Mr. C. W. Dilke corroborated his statements with respect to the jealousy with which the French at first regarded the discoveries of Mr. Talbot, in the application of the photographic principle to paper, and also with respect to the little attention which, until very recently, they had paid to that branch of the art.

It should be stated that the Society is indebted to Mr. Joseph Cundall for the suggestion to hold a Photographic Exhibition; and that both to him, to Mr. Philip Delamotte, and to Mr. Fenton our thanks are due for the valuable assistance they have rendered in procuring specimens and in arranging them in the rooms of the Society.

EAST INDIAN EXHIBITION.

A FURTHER communication has been received from Dr. Alexander Hunter, of Madras, relative to this subject, in which he says:

"I have already collected a considerable variety of articles for the Exhibition which the Society proposes to hold in London next year. Amongst these are samples of the oils, fixed and volatile; papers; materials used for cordage; woods used for carving; varieties of arrow-root; gums, and gum resins. From the mineral kingdom I have a very large collection, embracing several useful series of substances; as an assortment of mineral colours in their raw and prepared state; a complete series of the ores of iron, manganese, lead, antimony, and copper; all the varieties of corundum and emery; a large collection of white and coloured kaolins; with all the clays and minerals employed in the manufactures of porcelain, stoneware, and common pottery; the materials for glass and enamel; the alkalies and materials used in making soap; the magnesian minerals used in the arts and manufactures; and an interesting series of gypsum fossils. In the artistic department, which has always been to me the most inviting, I have a very large collection of designs, native patterns, and Indian sketches, with some finished paintings in oil and water colours, which I propose to send to the Exhibition. I shall also send a very large and progressive series of instructions in every branch of art, amounting to about 2,000 lessons, studies, prints, and paintings of different kinds, which I have purchased or had executed for the use of the pupils in my School of Industrial Arts."

SUBJECTS FOR PREMIUMS.

MANUFACTURES, which form the third section of the Premium List, is that to which our greatest efforts always have been, and will continue to be directed. This Society is the only centre which manufacturers have, and the pages of this Journal will be largely devoted to the advocacy of their interests, and to a record of their proceed-

ings. It will be observed that the questions are mostly addressed to those branches of trade which have recently been, or which it is hoped shortly will be, relieved from the trammels of the Excise Laws. The baneful influence which these laws have exercised, and their hindrance to all progress, is notorious. They have prevented improvement by obliging manufacturers to follow a beaten track, neither deviating to the right nor to the left. Look, for instance, at the wonderful impulse which the glass manufacture has received since the duty was removed; and the immense numbers of new applications of which it has been found capable by an alteration in the processes of its manufacture. With regard to bricks, it is well known that full advantage could not be taken of the modern invention of hollow bricks so long as the law imposed a limit on their size. Now we may expect to see them assume a variety of novel forms, and to be applied in a manner and for purposes little before thought of. Ventilation is already being effected through their instrumentality. Paper and soap may also be cited as articles which it is believed would be greatly improved, and their use much extended, by the entire removal of all restrictive duties. Both articles are made almost entirely from refuse materials, both are sold at a comparatively small price, and in both therefore the removal of a duty which forms a large portion of that price would admit of improvements being made. It is scarcely necessary again to refer to the necessity for that freedom of communication, and interchange of thought and opinion, which form the life and soul of a Society like this. Where all is secrecy, there can be no improvement; and, besides, one's own selfish purpose is sure to be defeated by such a mode of procedure.

CLASSES XI. TO XXIX.—MANUFACTURES.

TEXTILE FABRICS.

74. For an account of the methods at present employed in the Manufacture of Paper, for the various purposes of art and commerce; especially such as may be used for Printing, Talbotype, and Water-marking.

Recently, a variety of mechanical improvements have been introduced, to meet the increasing demand for this article, consequent on the diffusion of knowledge. The unsuccessful attempts which have been made to produce paper from fresh materials, should not deter manufacturers from pressing the inquiry. Good photogenic paper is still a desideratum. This leads to the belief that chemistry has not been sufficiently studied in connection with this trade.

75. For a Method of more thoroughly Sizing Machine-made Papers with Animal Size.

Papers of this description are greasy under the pen, and cannot be written on so freely as those sized with farina and resin soap. They, however, bear the ink better, and are generally stronger and harder. It, therefore, seems desirable to retain the animal sizing, but an improvement in the process for effecting it is much wanted.

76. For an essay on the application of Indigo in the Printing of Calico, with special reference to new processes.

The process of dyeing with indigo consists in de-oxidising it, or depriving it of a portion of its oxygen, when it assumes a green hue, becomes soluble in water, and then readily enters the pores of the cloth immersed in the indigo vat. When the cloth is properly saturated, it is exposed to the

action of the air, and the indigo speedily re-absorbs oxygen, and again assumes its original colour.

77. For improvements in Surface Printing Washing Fabrics, by which body colours may be employed, without liability of removal by the action of fluids.

Some of the specimens shown in the Indian Department of the Great Exhibition possessed this peculiarity, which was supposed to be due to the preparation of the colour in combination with a solution of India rubber.

78. For an account of improvements in the methods of producing Ornamental Designs on Silks, Satins, and Damasks; the designs to be of greater length, and obtained at less cost than by the Jacquard Loom.

Some recent discoveries in France have shown that fabrics woven in certain colours may be made to assume an artistic design, by discharging portions of those colours, by means of sulphuretted hydrogen gas; the design itself being retained by blocks or cylinders pressed tightly on the surface of the fabric.

79. For an improved method of Bleaching Linen safely and rapidly, and without the necessity of any after exposure "on the green."

The necessity for boiling goods in order to prepare them for bleaching, has been proposed to be overcome by expelling the air from the fibres,—which is supposed to be the real obstacle,—by pressure within a cylinder, in lieu of the old process.

80. For an account of recent improvements in the manufacture of Carpeting by steam power, whether Brussels, Velvet-pile, or Terry; especially of processes by which the warp-threads are coloured to form the pattern before weaving. Also for the application of new materials in the manufacture, uniting durability, economy, and elegance of design.

Several patents have been taken out for the application of steam-power to carpet-weaving, and are now being successfully worked. Many plans have also been introduced for the preparation of the yarn previous to being woven, for printing the woven fabric, and in the method of treating the terry, or pile; all tending to cheapen and improve the manufacture, and to increase the facilities for producing artistic designs.

81. For improvements in the Manufacture of Embroidery by machinery, so that the production may more closely resemble that now made by hand.

In hand-loom weaving the usual method of producing patterns of this kind in light fabrics, is to throw across the entire net, from selvage to selvage; the silk consequently floats on the back of the cloth, from figure to figure, causing a great loss of valuable material. When the floating woof is cut off, which must always be the case with light fabrics, the figures, not having a sufficient hold upon the warp, are liable to open out.

82. For any improvement in the make, form, or material of Hats.

Of late years, many new materials have been employed in this manufacture, tending to reduce the weight, and improve its appearance. French plush is universally admitted to be superior in dye, texture, and finish.

METALLIC, VITREOUS, AND CERAMIC MANUFACTURES.

83. For the invention of a good and cheap Lock, combining strength and great security from fraudulent attempts; cheapness, freedom from disarrangement by dirt, and requiring only a small key.

The deficiencies of some locks, and the dearness of others, renders this still a desideratum. Uniformity in the designs for locks, door-handles, finger-plates, and door furniture generally, is a point requiring attention.

84. For the best Essay on Ancient Goldsmiths' Work.

The chief defects at present experienced in connection with this art are the want of judgment in the selection of classic subjects, and of a sufficient knowledge of anatomy in treating them. Chasing in relief out of plate, either in medallion or in finish, combined with artistic effect, is still faulty and imperfect.

85. For an Essay on the combination of Engraving and Chasing, in connection with Electro-metallurgy, as applied to Art-manufactures.

It is considered that by uniting the two processes of Chasing and Engraving in the production of articles of *vertu*, and afterwards applying the process of Electrotyping, facilities would be afforded for multiplying designs, possessing greater boldness of relief and delicacy of finish, than those now made.

86. For any material improvement in the manufacture of Crown Glass, with special reference to transparency and durability of surface.

The German Crown Glass is said to be much superior to the English in this respect, being free from colour, and of great transparency. English glass-makers are in the habit of neutralizing the colour, and so making it disappear in their samples; but edgeways the resulting gray becomes evident. Light is not so much absorbed by the glass itself as obstructed by the foreign matter in its composition.

87. For the discovery of any mode for increasing the depth, brilliancy, and durability of the Colours used in Painting on Glass, either by an improved process in vitrifying, or by any other means.

It is well known that pot-metal Glass, or the kind of stained Glass formerly used for cathedral windows, has deeper colours, and presents a much richer effect, than can be produced by painting the surface. Any discovery which would impart additional depth and durability to the colour of such glasses as are painted or stained after their fabrication, as well as any improved method of glazing or vitrifying the painted surface after the colour has been put on, would be in the highest degree valuable.

88. For the discovery of a cheap and effectual method of Uniting Pieces of Coloured Glass, so as to supersede the use of lead joints, or other unsightly modes of joining, in the construction of Stained Glass Windows.

Considerable difficulty has attended the carrying out of a plan some time back proposed for this purpose, owing to the extreme brittleness which is communicated to the Glass when heated a second time, and from other causes. By avoiding the use of the slips of lead, for holding together differently coloured pieces of Glass, the appearance of windows of this kind might be improved, and greater scope and freedom afforded to the artist.

89. For a cheap and simple method of Casting Glass Pipes, for Draining, and other similar purposes.

It is said that at Maestricht, in Holland, Glass Pipes are now used in place of iron, for the conveyance of gas. An easy method of joining pipes of this material, so as to make them capable of resisting the pressure of water, and of being used for its conveyance, as well as for sewerage, is an object of great importance.

90. For the best account of the causes of the defects in Flint Glass, with the means which have been employed to remedy the same, accompanied by suggestions for the improvement of the manufacture.

It has been found that by covering the iron rod used for mixing the fluid metal in the pot with an earthen shield, discolouration and striæ are prevented.

91. For a method of producing large pieces of Glass, free from veins, perfectly homogeneous, and suitable for Optical Purposes.

A perfectly sound and durable surface, which shall not exude the alkali, so as to leave the Glass porous, is absolutely essential for optical or chemical purposes. Glass cannot be homogeneous that exudes any of its component parts.

92. For an Achromatic Lens, not less than three feet focus, capable of being used as quickly as smaller lenses, and suitable for Photographic purposes.

It is the want of homogeneity which prevents the manufacture of large achromatic lenses. The attempts to overcome this defect have been but partially successful, and it is to be feared that perfect homogeneity in glass will not be attained, as Dr. Faraday has shown that even water, upon becoming ice, often contains striæ.

93. For any important improvement in the construction of Kilns for Firing, or Baking Porcelain, China, and Earthenware.

It is well known that from the peculiar composition of Porcelain, large numbers of figures are spoilt in the kilns. The material itself is subject to great shrinkage, so that every part of an article submitted to the fire has to be carefully and accurately supported by a definite quantity of the same material, in order that the relative proportions of all the parts in the original model may appear in the finished manufacture. Perhaps it is equally important to improve the material, as the means employed for firing it.

94. For an account of improvements in the material and processes for Glazing Earthenware and China.

Lead has been used for giving a ready flow to the glaze, but is objected to, on account of its seriously affecting the health of the workmen. Although several plans have been proposed for superseding it, they have been found to act prejudicially on the colours and tints of colours used for giving effect to artistic designs.

MISCELLANEOUS MANUFACTURES.

95. For an essay on Architectural and Decorative Ornaments; the materials employed, their mode of manufacture, and the comparative cost of production.

Cement, leather, gutta-percha, cannabic composition, and a vast variety of other articles, are used for this purpose. But there scarcely appears to be any rule by which the adoption of one or the other is regulated. It is essential that a comparison should be made between them, so as to enable a decision to be arrived at as to which is the best, most economical, and most appropriate material to use under certain definite conditions.

96. For an essay on the best examples of Modern Furniture in various materials, exhibiting sound principles of construction, in combination with decorative art.

Since the introduction of papier maché and iron for articles of furniture, it has become extremely desirable that in applying the former the principles of construction on which strength depends should not be lost sight of, while with the latter attempts should not be made to produce foliated or sharp projecting angles.

97. For a means of "patching the sieve" used by Block Paper Stainers, without manual labour.

This work is at present performed by boys in England, and by girls in France. It is a purely mechanical operation, so that there is no reason why machinery should not be made to take the place of hand labour.

98. For an account of improvements in Printing Paper Hangings by machinery, by which solid ground, or other colours may be laid, and the objections at present existing to the use of size may be overcome.

The difficulties experienced in connection with machine-made Paper Hangings, is that of obtaining

clear solid colours, evenly distributed, and with great rapidity, as the cylinders do not take up the colours fast enough.

99. For the invention of an Artificial Stone, or Terra Cotta, free from the objections to which all such substances are now liable.

The best kinds of Artificial Stone at present known become decomposed on exposure to the atmosphere, owing to the efflorescence of the salts employed in their manufacture, so that the appearance of the work is completely destroyed.

100. For an account of any material improvement in the Moulding, Burning, or general Manufacture of Bricks; the chief qualities required being strength, indestructibility, and cheapness.

The mode in which this operation is carried on, even at the present day, is of the rudest kind. By the present system bricks are badly moulded and ill burnt; and the result is a material possessing few conditions of durability, or the power of resisting moisture. Machines for making bricks have hitherto been attended with very partial success; and the problem yet remains to be solved whether by the aid of machines or otherwise, bricks can be manufactured good in colour, light in weight, impervious to moisture, and possessing the essentials of durability, without sacrificing the principle of economy. The question of hollow bricks must of course form part of the inquiry, especially in reference to their economic employment in the dwellings of the labouring classes.

101. For an account of improved modes of treating and applying Gutta Percha, so as to render it less liable to be acted upon by changes of temperature.

This substance is yet new to commerce and the manufacturer; but the enormous extension of its application to various purposes of use and ornament appears to promise a still greater degree of commercial pre-eminence, and to justify the belief that many improvements will be made to meet the increased demand.

102. For the best account of the most recent applications of new materials and processes in the Manufacture of Soap.

The heavy restrictive duties, and the excise laws to which this article is subject, have impeded, and still tend to prevent any alteration in the materials and processes used in its production. Within the last few days ten tons of the oil of the *Bassia Latifolia*,—a tree indigenous to India, and first brought to the notice of the public through this Society, in 1849,—has been received for the purpose of testing the capability of its application to this manufacture. Recently, too, a cargo of crab oil obtained from the *Carapa Guianensis* has been imported into England from British Guiana.

103. For the invention of a good and cheap Candle for the use of Miners; to have a high melting point, and not be liable to waste or gutter.

Candles for this purpose should be capable of resisting rough usage, and the effects of heavy wet clay put round to hold them. They should not be liable to be blown out by draughts, or to be melted at high temperatures, to which they are submitted in some parts of the mine.

104. For the invention of a good and cheap Bedroom Candle, requiring no snuffing, and not liable to gutter or drip when carried about.

Until the use of gas becomes more general in private houses, as in Edinburgh, this will be recognized as an important article of domestic use, requiring and capable of great improvement.

105. For the best account and collection of specimens of the various materials and processes employed in the production of Artificial Flowers.

In the manufacture of Artificial Flowers, many different materials, as cambric, feathers, &c., are employed, each requiring a different treatment, and a more than usual amount of skill in the imitation of natural texture. In addition to durability, the advantageous application of varied materials, and, finally, cheapness of production, have to be considered.

At its Institution the Society of Arts was the sole public body specially encouraging the Fine Arts. Within its walls the first meeting of the Royal Academy took place. The Department of Practical Art has received its present form greatly in consequence of the Exhibition of 1851, in which the Society was an active agent. These and other Institutions occupy much of the ground originally taken up by the Society, and many of its objects of encouragement in art are thus adequately fostered.

The Society, in consequence, would seek to reward in art those objects not already provided for. It desires to encourage Design in "Pure Outline" of poetic and historic subjects; any specimens of which will meet with its careful consideration. It also desires to call forth an union of scientific and artistic delineation much wanted for the illustration of educational works and lectures. It will also have much pleasure in rewarding any novel and beautiful design in art adapted for manufacture, of which the subject may not be specially, by name, comprised in any contemporary list of subjects for premiums put forth by any other Institution.

The following List (without restricting competition to the examples given) points to the class of subjects in outline and "scientific delineation" in which the Society desires to reward excellence. In art design for manufacture, the candidate will find reward open, in directions not noticed by other lists of subjects for premiums.

CLASS XXX.—FINE ARTS.

106. For the best series of four Outline Drawings in illustration of the Approach of Night, as described in Petrarch's third Ode, commencing with, "Nella stagion che 'l ciel rapido inclina." *

107. For the best series of four Botanical and Structural Drawings of a Forest-tree.

108. For the best series of four Botanical and Structural Drawings of one of the Cerealia.

109. For the best series of four coloured Botanical and Structural Drawings of any well-known English Plant.

110. For the best series of four Drawings of any Animal, displaying its anatomy.

111. For the best series of four large Drawings or Diagrams, suitable for Lecturers, in illustration of any special branch of Natural History, as the Hemp or the Flax-plant, the Silk-worm, the Cochineal Insect, &c.; the above drawings to be of sizes proper for lecture illustration.

112. For the best series of four large Drawings, or Diagrams, suitable for Lecturers, in illustration of any piece of Machinery, as a Loom, Steam Press, Paper Engine, &c.; each drawing to be not less than three feet by four feet.

* In the London edition of 1784, this line occurs at the commencement of the ninth canto; and in the Paris edition of 1836, of the fifth canto.

It should be stated that the Society in all cases expressly reserves the power of rewarding each communication in proportion to its merit, or even of withholding the Premium altogether. In regard to Colonial Produce of all kinds, it is absolutely necessary that a certificate from the Governor, or other qualified person, should accompany the samples sent to the Society, certifying that they really are the produce of the particular district referred to. The samples should be sufficient in quantity to enable experiments to be made, and an opinion to be formed of their quality. Cotton should be sent both in seed and picked. Flax should be accompanied by a description of the culture, the nature of the soil, the weight of the produce per acre, and the extent to which it is cultivated in the particular district. Silk, by a description of the method by which the silkworms were managed; of the kind of trees or plants on which they were fed, and particulars respecting the culture of such trees and plants. Wine, by an accurate description of the vineyards from whence produced. In every instance the maximum extent of the plantation from which the produce has been taken must be stated; with the average yield obtained, and whether similar articles have hitherto been exported from the Colony, or not, and in what quantities. All communications, and articles intended for competition, must be delivered to the Secretary, at the Society's house, where copies of the Premium List, and any further information, may be obtained, free of expense, on or before the 31st of March, 1853. This restriction, as to the date of receipt, does not apply to articles of Colonial produce.

COLONIAL CORRESPONDENCE.

COFFEE-CURING.

Two medals have recently been awarded for subjects of importance connected with the Colonies, the one to Dr. Edward Stolle, of Berlin, for his Essay on the Manufacture of Sugar; and the other to Mr. W. Clerichew, of the Rathoongodde Plantation, in Ceylon, for his Improvements in the curing of Coffee. In the former case, the paper in question was originally sent to the Society in competition for the medal specially offered by His Royal Highness, the President, for the best essay on the manufacture of sugar, but it arrived too late,—not being received in fact till the medal had already been awarded to another competitor. Nevertheless, Dr. Stolle's paper was referred to a Committee, and having been very favourably reported on as highly deserving of reward, it was decided that the large Medal of the Society should be presented to him. Upon this decision being communicated to the President, he was graciously pleased to desire that a duplicate of his own special Medal should be presented to Dr. Stolle instead of the ordinary Medal of the Society; and this has accordingly been done.

In order to explain the precise nature of the improvements which Mr. Clerichew has introduced in the curing of coffee, it will perhaps be most convenient to give a brief abstract of parts of his elaborate communication on the subject.

The ordinary process of curing coffee consists of several operations; in the first place, the ripe fruit when picked has to be "pulped," the outer soft fleshy covering being thereby removed from the true berry, or seed, which is then left covered by a thin skin called the parchment, and more or less contaminated with mucilage. In order to remove this, the berries are allowed to remain for about twenty-four hours in a suitable cistern till fermentation has commenced; the cistern is then filled with water, and the whole is well stirred up with wooden rakes, till the mucilage is entirely separated. The third and last part of the process consists in drying the coffee; and the success with which this is effected depends in a great measure upon the comparative dryness or moisture of the season. In moist weather the berry is very apt to become mouldy, or even to heat, and undergo partial putrefaction. In order to prevent these very injurious consequences, coffee-curers are in the habit of turning over the berries by the manual labour of relays of Coolies working night and day—the evil is thus checked and diminished; but when once fermentation has commenced, it is never wholly stopped, and the value of the coffee is always lessened.

The worth of coffee, as an article of commerce, is lessened in proportion to the extent to which fermentation has been allowed to proceed. If heating has taken place, the bean never afterwards acquires that pellucid appearance and colour which is indicative of well-cured coffee. If mouldiness has commenced, the aromatic flavour is invariably injured; and if this is allowed to proceed to a state of incipient putrefaction, the coffee assumes a dull black colour, and is then entirely destitute of value. The difficulty of curing coffee is increased by the fact that it generally has to be done during the prevalence of the periodical rains, and therefore when the atmosphere is loaded with moisture.

From long experience of the difficulties attending the old modes of curing coffee, and from a careful consideration of the causes which led to its injury whilst drying, Mr. Clerichew was induced to try and introduce an improved process. It occurred to him that if it was possible by means of revolving fans to establish currents of air throughout the whole mass of the coffee to be dried, spread upon perforated floors, the chief source of evil, the stagnation of damp air between the berries, would be obviated. This plan was put in operation in 1849, and was found perfectly to answer the inventor's expectations.

Mr. Clerichew has submitted to the Society a full account of the mills, machinery, and drying-houses erected on the Rathoongodde estate, accompanied by a series of carefully executed drawings. The floors of the curing-houses are covered with laths two inches apart, over which an open coir matting is stretched; the roofs are covered with felt, or thin sheet-iron, and, being thin, the temperature of the air in the upper part on a fine day is often raised to as much as 120° from the heat of the sun. Stoves are placed in the lower floors of the drying-houses; and in these the coffee when brought from the pulping and washing-cisterns, is, in the first instance, partially dried; when by the application of artificial heat the surface-water has been

carried off, the coffee is removed into the upper floors, and its drying completed by the aid of natural heat.

Several different contrivances have been already suggested and applied in Ceylon, in which furnaces or stoves are employed to aid in the drying of the coffee; but in none of these the constant and regular circulation of the heated air through the mass of the coffee was introduced. In Mr. Clerichew's arrangement, the heated air is introduced underneath the floors of the drying-chambers, and drawn through the coffee, which is spread over them, by means of a series of powerful revolving fans. By altering the size and number of the fans, by increasing or diminishing the velocity with which they are made to revolve, and by closing or opening various apertures in the sides and upper part of the buildings, the drying of the coffee may be accelerated or retarded at pleasure. In very wet seasons it is difficult even in this mode of curing coffee to dry the berries,—the process is slow and very tedious; but even under these circumstances it keeps perfectly sweet and fresh, requires no hand labour, and does not acquire any mouldy flavour.

From the evidence brought before the Society, it appears that the improvement introduced by Mr. Clerichew perfectly answers the object for which it was intended, and that the coffee cured by his process is of very superior quality. It is right to state, that as far as regards the question of originality, the claims of several inventors may be raised in opposition to that of Mr. Clerichew, for a somewhat similar process has several times been suggested,—as for example by Mr. Davison, in his patent taken out in 1843, which was described in a paper read before the Society in April, 1847. Nevertheless, as Mr. Clerichew seems to have been the first practically to apply these principles to the curing of coffee, and as the arrangements which he has adopted are highly ingenious and complete, the Society determined to testify their approbation by presenting to him their medal.

HOME CORRESPONDENCE.

PEOPLES' COLLEGES.

Sheffield.

SIR,—As there have been several references to "Peoples Colleges" in the preceding Numbers of the Journal, I think a few remarks concerning our College here, its objects, and the mode in which it is managed, will be interesting to many of your readers. The basis of the People's College is a most popular one; as the name implies, it is *for* and *by the People*; and it aims to be, according to its name, a *College*. The list of classes is subject to periodical revision; and while attention is constantly paid to the general branches of instruction that come within the popular reach, it will also be perceived that the more advanced studies are not neglected, and, as opportunity arises, new subjects are introduced, new classes are formed, and every branch is vigorously kept in operation. It has never been part of our plan to make Lectures a prominent feature of the Institution: the reason is well expressed by H. S. in page 9 of the Journal of the Society of Arts. Lectures cannot, at the same time, meet both the wants of tyros

and of more advanced students. Still, it was thought advisable to have a connection with the scientific and literary gentlemen of the town, and for this purpose our monthly lectures are given, and have been willingly supplied.

Perhaps I could not better convey to you the means of working the People's College than by a plain statement of the fact. Every half-year the secretary takes down the names of the most advanced and worthy members of the College. He communicates with them, and invites them to meet the Committee at a certain time. The meeting is held, and the nature, constitution, objects, wants, &c., of the Institution are explained. The utmost cordiality prevails, and the Secretary takes the class-list and goes through the classes *seriatim*; monitors are appointed for each, who feel honoured by the appointment, and most cheerfully and efficiently perform the duties pertaining to the office. Then, to instruct these monitors, professional gentlemen are engaged for the French and German languages; and what are called the senior classes of the English department (not in point of age, but of higher attainments), are conducted by three of the most competent members of the College. Take, for instance, the Senior Composition-class: at the Half-yearly Meeting, the Secretary takes the names of about twenty students, who are appointed to read essays during the half-year. A list of these hangs in the room, with the name of the writer and date of reading. At the appointed time, the class-monitor announces "The Composition-class" in every room in the Institution. The students assemble from the other studies in which they have been engaged. The monitor of the class refers to the list, and says, "Mr. — is the reader; is he present?" He answers by rising, and taking his place (standing) by the side of the monitor. The monitor briefly addresses the members of the class, to direct their criticism—to explain that the object of the class is not discussion, but *literary criticism*. Though they may question an opinion, or dispute a fact, or ask (through the monitor) for explanations, yet their chief attention must be to the *composition* as a literary production. He urges upon them the importance of taking notes, &c. The reader then announces his subject (the choice of which is left to himself), and reads an essay, which occupies from fifteen to thirty minutes. The monitor then asks the students individually for their opinions, and sometimes there are most instructive criticisms offered, and the monitor acts as a sort of moderator against all offensive remarks. At the conclusion he offers his own observations; and again referring to the list, says, "Mr. — will read next week." Should any of those appointed fail to bring an essay, the monitor gives a dissertation on "Style," on "Literary Men," "The Struggles and Triumphs of Authors," &c.; or reads an essay of Dr. Johnson, Addison, &c. I have known the burly Dr. (whose essay was read *inco*g.) most severely used. Sometimes, the class will define literary terms—thus: "What is Criticism?" "What is Taste?" "What is Style?" "Beauties and Defects of Style;" "What constitutes *good composition*?" The consideration of these and kindred subjects, it is evident, must have great influence in forming habits of correct thinking and in improving the taste, and, I believe, the general character of the members. The Elocution-class is conducted on similar principles; and in the junior (elementary) classes the rudiments are taught by the same monitors. I believe the success of the People's College is mainly owing to the vigour of its management; and the only fear of failure is an over-confidence in the Committee, or neglect of the excellent rules laid down at its foundation. But, popularly constituted as it is, it ought at all times to ensure an energetic, though scrupu-

lously just, Committee, which must command success. It will naturally be asked, Cannot similar Institutions be founded elsewhere? They may be: but it will require some person or persons acquainted with the practical working of them to begin successfully. The difficulty will be in the *beginning*; but difficulty does not imply failure, or there would have been no People's College in Sheffield. Those who would commence other Institutions of the same kind must be prepared to encounter similar obstacles to those which the first Committee of the People's College encountered and overcame; and, above all, having arranged a good and effective mode of management, and having laid down a sound and well-considered code of laws, they must guard against prosperity as well as against failure, and must take care, if their Institution flourishes, that those regulations are not set aside or neglected as unnecessary. It is a common error to believe that a flourishing Institution may dispense with those laws which were considered essential at its foundation; but it is a fatal error, and one which invariably leads to the most disastrous consequences.

J. W.

PHOTOGRAPHY.

SIR,—I have much pleasure in contributing to your Exhibition a book of Photographs, entitled, *Le Premier livre Imprimé par le Soleil*. The history of it is this. In the year 1839, when residing in Switzerland, I saw one of the first specimens of the Daguerreotype, and the idea immediately struck me, how much better it would be if the picture could be produced on paper instead of on silver. I was thus induced to experiment on this subject. A short time afterwards, I found that Professor Gerber, of Bern, had been trying to accomplish this with nitrate of silver, but the difficulty was found to be in the fixing. Acting upon some ideas communicated by Professor Gerber, I at length succeeded in producing the specimens now exhibited. Professor Agassiz, who took great interest in my labours, gave me letters to Mr. Robert Brown and M. Arago, suggesting the important use it might be to botanists. On showing the book, however, to M. Arago, at Paris, at the commencement of the year 1840, he informed me that Mr. Fox Talbot had worked on the same subject, and had patented a process. This stopped my proceedings. I have to state, that my method of fixing is *totally different* from that now practised.

L. L. BOSCAWEN IBBETSON

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

INSTITUTE OF BRITISH ARCHITECTS, DEC. 13.—Mr. G. R. Burnett read a paper entitled, "Observations made during an Excursion in the Province of Orense, in the kingdom of Galicia, Spain," in which, after describing the town of Vigo and the Cathedral of Orense, he stated that in laying out the new roads in Spain four classes had been adopted; the first including all roads between the capital and the seaports, or the frontiers of the kingdom; the second including all roads which communicated between two or more provinces; the third including all roads which communicated between two or more important towns in a province; and the fourth including what would be called in England parish roads. These were of the respective total widths of 36, 32, 28, and 24 Spanish feet. The gradients

were generally not steeper than 1 in 18, but in some very difficult passes the gradients had been made as steep as 1 in 12. In the more recently executed parts no waters were allowed to pass over the roads, but in some of the more ancient there were paved granite channels, called "Badenas," to carry small streams. When streams were carried under the roads, they were invariably conducted in masonry culverts. It was only exceptionally, as in the abutments of the Pontonesy Puentes, or in the vousssoirs of the arches, that ashlar in regular courses was used. In all other cases rubble masonry without mortar was employed; and so skilful were the Gallego masons in the execution of this work, that even their houses, of three or four stories, were built in the same manner, and subsequently either pointed or rendered with lime mortar. The bridges on the road from Vigo to Orense were elegant in their proportions, of a broad, simple, massive character, and executed with a remarkable degree of perfection. The earth-works were executed in a very primitive style. A tool called the "azadon," participating of the character of the hoe, the spade, and the pick, was used by the excavators to remove the earth into baskets called "cestos," each of which contained about three quarters of a cubic foot. When these baskets were filled, they were hoisted upon the heads of women, and by them carried to the place of deposit.

INSTITUTE OF ACTUARIES.—December 27. John Finlaison, Esq., President, in the chair. Eleven Associates were elected. Mr. Jellicoe, V.P., read a paper "On the objectionable character of certain Methods very generally practised for determining and dividing Surplus in Life Assurance Companies."

After some remarks on the construction of the tables used by Life Assurance Offices, and the unfitness of such as that called the "Northampton," to be employed in certain of their calculations, the author proceeded to point out the unsatisfactory and delusive character of the old method of estimating the liability of these Societies, which, as was well known, gave a fictitious, and, as was supposed, a greater than the true value to such liability. He showed that this was by no means the case under given conditions, and that the results were never to be depended upon under any circumstances. The only safe and proper mode was to determine the value of the actual income from premiums as nearly as possible, setting aside such part as was intended to provide for the risks, and also such other remaining part as at the outset had been thought necessary to meet extra contingencies. To omit this last, as was strongly advocated by some gentlemen, was in fact to leave out one of the most important elements in the estimate, and would render the rest all but valueless. The advocates of the contrary practice, who were so afraid of introducing this quantity lest it should be in any part appropriated, appeared to forget that there might be no margin at all, as well as a large one; and that, in their anxious desire to conceal the latter state of affairs, they were quite keeping out of sight the danger arising from the former. The attention of the meeting was then drawn to the subject of the Division of Surplus, and the three modes most commonly adopted for

the purpose were described, viz. : the division in proportion to the amount at interest of the premiums paid, in the ratio indicated by the value of the assurance, and in that denoted by the difference of these two quantities. The results afforded by these methods were contrasted with those given by the correct one, and it appeared that all three erred in the same direction, but in slightly different degrees ; that is to say, all gave an undue share of the surplus to the older, at the expense of the younger members. The author explained the reason of this similarity of operation ; and concluded by showing, that, on assumption, the additions made to assurances up to the present time, were no more than 4,656,000*l.* ; then, that the portion given to the older members at the expense of the younger ones was more than half a million, or considerably upwards of ten per cent. of the total sum added.

PROCEEDINGS OF INSTITUTIONS.

CAMBRIDGE.—The Half-yearly Meeting of the Philo Union Literary Society was held on Wednesday evening. The treasurer produced his accounts, which had been duly audited, and congratulated the members that he had a considerable balance in hand for the purchase of new books. The librarian's report showed that thirty new volumes had been added to, and 1,800 volumes borrowed from, the library during the past six months. Mr. Cockerell, in an eloquent address, presented, on behalf of himself and other subscribers, six portraits of British worthies, handsomely framed, for the adornment of the reading-room. Three new members were proposed, and the following gentlemen elected officers for the ensuing half-year :—*President* : Mr. C. H. Cooper, F.S.A.—*Vice-Presidents* : Messrs. Fenner, Martin, Webb, and Knowles.—*Treasurer* : Mr. Rowe.—*Secretary* : Mr. Reynolds Rowe.—*Librarians* : Messrs. Collings, Goody, and Johns.

CHELTENHAM.—The first course of lectures at the Literary and Philosophical Institution closed on Tuesday, the 21st inst., with a Lecture on Architecture, by J. Clarke, Esq., when it was announced by the President that arrangements had been made for a second course, extending over the next three months. On the 9th inst. an address on the establishment of Elementary Schools of Art was delivered by Lord Ward to a crowded and enthusiastic audience at the Town Hall, and it is expected that these classes may ultimately be brought into union with the Literary and Philosophical Institution.

CORFE CASTLE.—On Thursday, the 9th inst., Mr. Chatterton delivered his Lecture on the "Harp," at the British School-room, to the members of the Mutual Improvement Society, who mustered in great force, and were especially charmed with the illustrational portion of the lecture. This Society was established early in 1851, and received sixty-one contributions during the first year. It has been fostered by the Right Hon. George Barkes, M.P., the President, assisted by the nobility, clergy, and gentry of the district. There are a reading-room and library ;

and occasionally lectures are given. The President has promised to give a lecture himself shortly.

DARLINGTON.—On Tuesday evening Mr. E. W. Jackson, of Norton, delivered his concluding Lecture at the Mechanics' Institution, on the moral, social, and physical condition of the people of this country during the last half century. The interest which the two former lectures afforded was more than sustained on the present occasion, and many of the eloquent reflections upon the greatly improved condition of all classes, during the period referred to, were received with much apparent satisfaction.

GREENWICH.—Mr. C. W. Connon did a bold thing in offering to lecture on Lord Bacon before a popular audience, and the Directors of the Society for the Diffusion of Useful Knowledge did a very wise thing in accepting the offer. Though his lordship is the patron saint of this and many other kindred institutions, the homage he receives is rather a blind worship, founded on hearsay, than an enlightened veneration based on knowledge. It is highly proper, then, that the admirers of Bacon should "declare," that is, set forth and expound unto the people, the philosopher whom they now "ignorantly worship." The course consisted of three lectures ; one on the Life of Bacon, another on his Philosophy, and a third on his popular Writings, particularly the "Essays," which have come so home to men's "business and bosoms." Mr. Connon skilfully relieved the necessary dryness of his second Lecture by reading some of Bacon's Apothegms, which came on the audience with all the force of novelty. In the third the lecturer excited no little interest by his onslaught on the "Transcendentalists," of whom he selected Emerson as a type. He was prepared to uphold the honour of Bacon, Locke, Addison, and that class of good old English writers, who say plainly and forcibly what they mean, "against all comers whatsoever." The course, as a whole, was well received.

HASTINGS.—On Monday evening a lecture was given, at the Mechanics' Institution, by Mr. W. Ransom, jun., on Self-Education.

The lecturer began by urging the importance of mental culture, and by making some remarks on the proper selection of books by self-educating working men. Our cheap literature was then descanted on, discriminating observations being made on the various classes of works included in that category. Several subjects of study, religious, scientific, and philosophical, were next recommended, and the most useful books pointed out for study under those several heads. The place occupied by Mechanics' Institutions in the work of self-tuition was then indicated, and the relation adverted to which subsists between them and the Mercury of knowledge, the Press. In that part of the lecture referring to religious culture as "necessary both to lead us to truth, and to teach us to maintain it when discovered," remarks were made on modern theological literature ; and, in conclusion, the lecturer said, that education was not simply to store the memory with facts, but rather to fill the heart with right feeling and to fortify the soul with right principle. The merely stored man was a walking automaton only—another man's ware-

house. He who studied for mental discipline as well as to acquire information, was the real man—the living being into whose spirit the Almighty had breathed the breath of life. He exhorted them to strive to learn how to think as well as what to think; that their minds might have a self-determining power of their own, a power that took hold of all educational elements and all external influences, and shaped them to ends and conclusions worthy of an independent and intelligent will.

ST. IVES.—On Wednesday evening last, the first of three Lectures on “Monmouth’s Rebellion” was delivered by Mr. W. L. Evans, in the Public Institution. The subject of the present Lecture was “Monmouth’s Boyhood, Manhood, Policy of the Royal Brothers,” which gave great satisfaction to those present.

NEWCASTLE.—On Monday and Wednesday evenings two lectures were delivered in the Lecture Room of the Literary and Philosophical Society, by C. T. Downing, Esq., M.D., “On the Empire of Japan.” The lecturer commenced by stating, that the Japanese had most rigorously prohibited all foreign intercourse, but the time had come when it was deemed a matter of propriety to compel them to trade with other nations. As an instance of the severity of their laws relative to foreign intercourse, it was said that when Japanese mariners were wrecked and cast ashore on other lands, they were never permitted to go back to their native country. Formerly it was supposed they were a barbarous and unenlightened people; but it had been ascertained that they were considerably advanced in science, and that their proficiency in art was almost unrivalled, while their manners, customs, and institutions were by no means undeserving of respect. The lecturer then proceeded to describe the Japanese Islands, together with many other instructive and interesting particulars indicative of their industry, habits, and resources. On the second evening he dilated on the institutions of the country, its government, soldiers, merchants, policy, future prospects, &c. &c.

SHEERNESS.—The members of the Isle of Sheppey Mechanics’ Institution were highly gratified on Tuesday, the 21st inst., by listening to a very interesting Lecture on Light, delivered by Mr. Barnaby, one of the members. After describing the various theories of light, in a very lucid and pleasing manner, the lecturer concluded by exhibiting the oxyhydrogen light; and stated that, on a future occasion, he would discuss in detail the different methods of artificial illuminations, and the various processes by which they were obtained.

NOTICES TO CORRESPONDENTS.

Country Institutions.—Correspondents who are so good as to send reports of proceedings, are requested to forward them not later than Tuesday morning, or they will be too late for insertion in the following Friday’s Journal.

Subscribers to Journal.—We cannot undertake to forward the Journal to unknown correspondents. In reply to a number of communications, we must state that it can be obtained through the usual trade channels.

Members.—Several Members of the Society have complained of not receiving the Journal. In every case, however, it has been found that they were duly delivered, and that the blame really rested with the Members’ servants.

Members who can furnish original information or suggestions on the subjects included in the Society’s Premium-list, or other topics connected with the Society’s various departments of operation, are invited to communicate the same to the Secretary, in as condensed a form as possible, for the purpose of being either read and discussed at the evening meetings, or inserted in the Society’s weekly Journal.

Petitions.—In answer to numerous inquiries as to the best time for presenting petitions to Parliament respecting the distribution of Parliamentary Reports, we have to state that any time during the next six weeks will do.

Anonymous letters cannot be attended to. All communications, whether the author’s name is to appear or not, must be accompanied by the writer’s name and address.

ANSWERS TO CORRESPONDENTS.

Coating for Ships.—“Your correspondent (No. 8) will find much useful information on this subject in four most elaborate papers by Mr. J. I. Wilkinson, who has treated the question historically, and dealt respectively with wood, lead, copper, and iron sheathing. It would appear that the art of sheathing vessels was early practised in China; a mixture of fish-oil and lime, which was very adhesive, and became so hard that the worm could not penetrate it, being used for that purpose. In the reign of Henry VIII. large vessels had a coating of loose animal hair, attached with pitch, over which a sheathing-board of about an inch in thickness was fastened. In 1670 a patent was granted to Sir Philip Howard and to Major Watson, for the use of milled lead sheathing, which, about the year 1700, was abandoned, on account of the rapid corrosion of the rudders; and wood sheathing was again used. On the first introduction of copper, it was used in conjunction with iron bolts and other fastenings; these soon oxidized, and serious accidents occurred. The attention of Sir Humphrey Davy having been directed to the subject, he discovered that when two dissimilar metals were in contact, and immersed in sea-water, a voltaic effect was produced, which occasioned a rapid corrosion of the more oxidable metal, while the others remained uninjured. This he proposed to remedy by the addition of six protectors of cast-iron, two placed midships on the keel of the ship, two on the bows, and two on the stern. As far as the philosophical fact was concerned, the result was conclusive; but inconveniences of another character arose, for the whole surface of the copper became covered with barnacles and seaweeds. Metallic sheathing, or a coating of metallic oxide, formed by driving broad-headed scupper-nails into the sheathing-board, is said to have been used by the Romans; but authentic records exist of the plan having been practised in this country in the year 1666. This mode of protection is also said to be well adapted to the timber piles of harbours, and other structures. More recently, Mr. Bethell has introduced a process of creosoting timber, by the injection into it of oil of gas-tar. The timber being placed in a vessel from which the air is exhausted, becomes thoroughly impregnated with the oil, which is insoluble in water, and so nauseous that no animal or insect can bear its smell. Creosoted timber has been extensively used for railway sleepers, and also for the piers of many engineering structures. Several other processes for preserving timber by the injection of soluble salts, such as corrosive sublimate, sulphate of copper, &c., have been patented by Burnett, Payne, and others; but it is believed, that as their efficacy depends upon coagulating the albumen and the sap of the wood, the activity of the poison is neutralised. At the Great Exhibition, Captain Peacock, R.N., exhibited some specimens of timber prepared with a new description of metallic paint, or composition, named “Anti-Sargassian,” which has since been extensively applied to ships in the Royal Navy, and to those belonging to the West India, Peninsular and Oriental, and other large Steam-packet Companies. It has also been used for the sleepers of the Lima and Callao Railway, and the Copiapo Railway and Pier in South America. The salt-vessels plying on the coast of India use oil of tar, and a considerable quantity of castor-oil, mixed with cow-dung, which, while it adhered to the wood, was an effectual protection for the sides of the vessels. The “Jarrah” timber of Western Australia has been stated to be capable of resisting the ravages both of the *Teredo Navalis* and the *White Ant*; and colonial vessels built of that material have, it is said, traded among the islands of the Indian Archipelago for many years without being coppered.”—A. S.

Cement for Roads (15).—“My impression of the matter is, that as roads are at present constructed and mended, none of the quick-setting cements (such as Portland or Roman cement) would effectually bind together the broken metal used in repairing Macadamized roads, and for this reason: immediately the stone is dressed on the road, and the scrapings thrown on, the way is opened to the public, and the materials combine and consolidate by dint of pounding and violent percussion. This would not answer with cement, since the process of induration would be interfered with and destroyed by any such sudden and ‘shocking’

contact with heavy bodies. Where time is not an object, a concrete may doubtless be made of Portland cement, small gravel, and granite chippings, which will prove very durable; but it must be laid on four to five inches thick, and will necessarily prove expensive. It is possible, that tar or bitumen of some sort might answer the purpose, though I should fear that the sudden and violent action of horses' hoofs and wheels would have the same injurious and disturbing effect on this material as on cement. Years ago, Mr. Telford used cement in the formation of the Highgate Archway road, but only as a foundation six inches below the surface. Top-dressing of granite was then laid on, and it has been one of the most enduring, because the best drained, roads anywhere about London. This example, coupled with other experience, convinces me that a good foundation is of the first importance, and that it is of far more consequence than mixing cementing material with the surface dressing, since consolidation takes place in the great thoroughfares quickly enough without it. There is much more to be said on the subject, but this will doubtless suffice for the question under consideration."—G. F. W.

"W. R." is informed that there are no initial letters for Members of the Society of Arts. The letters, "F. S. A.," to which our Correspondent refers, signify, "Fellow of the Royal Society of Antiquaries."

MISCELLANEA.

FLAX.—A new mode of preparing flax has lately been proposed by Mr. Watt, intended to do away with the process of "retting" altogether; and from a Report just published by the Royal Flax Improvement Society of Ireland, there seems good reason to believe that its introduction may hereafter lead to considerable improvements in this very important manufacture. In Mr. Watt's process, the ripe flax straw, as brought from the farm, is, in the first instance, passed through rollers to remove the seed; the straw is then placed in suitable close chambers of iron, having false bottoms of sheet-iron perforated with many holes. In these chambers it is exposed to the action of a current of steam for eight or ten hours; the condensed steam being, towards the end of the process, returned by means of a force-pump, and sprinkled again over the straw. After about twelve hours the operation is completed, and the wet and swollen flax straw, deprived of the whole of the soluble matters which it naturally contains, is removed from the steam-chests, and passed at once through rollers, which squeeze out any remaining water, and at the same time separate the epidermis of the straw. The flax is then dried, and in a few hours is ready for scutching. The whole time required therefore to convert flax straw into scutch flax, fit for the spinner, is about thirty-six hours; and the flax, which has thus been prepared under the superintendence of a Committee of the Flax Improvement Society of Belfast, in accordance with Mr. Watt's process, is declared by competent judges to be of excellent quality, varying in value from 60*l.* to 70*l.* per ton.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.
From Gazette, 24th Dec., 1852.

- Dated 8th Dec.*
992. J. Browne—Preventing escape of smoke from chimnies and consuming it.
996. J. Symonds and G. Mouchet—Cleaning metallic surfaces.
998. D. Beatson and T. Hill—Propelling ships.
1000. J. Lawrence—Projectiles.
1002. J. S. Wilson—Propelling.
1004. J. Hopkins—Obtaining line parallel to axis of the earth.
Dated 9th Dec.
1007. W. Mather—Plasters and machinery for same.
1008. W. Baddeley—Metal pipes.
1009. W. Allchin—Agricultural and other steam-engines.
1010. E. Hunt—Screw-propeller.
1011. E. T. Loseby—Timekeepers and cases.
1012. C. Greenaway—Anchors.

1013. G. Collier—Carpets and other fabrics.
1014. T. Masters—Cleaning knives and other steel articles.
Dated 10th Dec.
1015. J. Sheringham—Stove grates.
1016. J. C. Blackwell—Musical instruments.
1017. A. T. Jay—Safety letter-box.
1018. T. A. Smithson and G. H. Adam—Suspending carriage-bodies.
1019. J. Derrington and J. Chadwick—Cocks and valves.
1020. R. A. Brooman—Evaporating apparatus.
1021. J. Boileve—Dessicating-apparatus (a communication).
Dated 11th Dec.
1022. T. Boardman—Looms for weaving.
1023. W. Rothera—Manufacturing nails, screw blanks, &c.
1024. G. D. Howell—Ventilation.
1025. J. Martin—Artificial fuel.
1026. E. Bates—Breaks.
1027. W. Sorrell—Furnaces and fire-places for consuming smoke.
1028. A. White—Apparatus for retarding and stopping railway trains.
1029. C. Bedells—Improvements in reels.
1030. S. Green—Joining earthenware pipes.
1031. G. Dixon—Refining sugar.
1032. T. Morris and W. Johnson—Depositing alloys of metals.
1033. C. Ritchie—Measuring fluids.
1034. J. T. Way and J. M. Paine—Manufacture of glass.
1035. C. Griffin—Obtaining metallic copper from natural solution.

Dated 13th Dec.

1036. J. Glasson—Boilers.
1037. J. Hamblet and W. Dean—Bricks.
1039. G. Mackay—Stirrup.
1040. G. Mackay—Paddle-wheel.
1041. A. V. Newton—Regulating density of fluids.
1042. J. Lejeune—Machine for washing linen, &c.
1043. F. Dangerfield—Lithographic press.
1044. D. Napier—Steam-engines.
1045. H. Clayton—Bricks.
1046. W. H. Fox Talbot—Motive power.
1047. A. Ripley—Axles for railway wheels.
Dated 14th Dec.
1048. J. Bell—Railway chairs.
1049. C. E. Magnant—Tanning.
1050. J. N. Taylor—Ships windlasses and other winches.
1053. J. Baggs—Extracting gold and silver from ores.
1054. J. H. Johnson—Fire-grates and fire-places.
1055. W. Johnson—Manufacture of aerated waters (a communication).
1056. J. H. Johnson—Wind-guards (a communication).
1057. J. G. Jennings—Construction of drains.
1058. R. Appel—Anastatic printing.
1059. J. P. M. Floret—Producing simultaneously gaslight and lime plaster.

APPLICATIONS WITH COMPLETE SPECIFICATION FILED.

Dated 20th Dec.

1108. J. N. Adorno—Manufacture of cigars.
1113. C. and T. Pilkington and A. Predijor—Joiner's brace.
From Gazette, 28th Dec.
NONE.

WEEKLY LIST OF PATENTS SEALED.

Dated 24th Dec., 1852.

97. John Macmillan Dunlop, of Manchester—Improvements in the manufacture of wheels for carriages.
174. Alexander Campbell Duncan, of Glasgow—Improvements in the art or process of dyeing cotton, or other textile fabrics, or cotton with other yarns, when printed or mordanted with the colouring matter of madder, or of dyewoods, and in machinery or apparatus employed therein.
285. Edwin Pettit, of Kingsland, and James Forsyth, of Calbeck, Cumberland—Improvements in spinning and drawing cotton and other fibrous substances, and machinery for that purpose.
365. Edward Lloyd, of Dee Valley, near Corwen, Merionethshire—Improvements in steam-engines, the whole or part of which improvements are applicable to other motive engines.
550. John Wormald, of Manchester—Improvements in machinery or apparatus for roving, spinning, and doubling cotton, wool, or other fibrous substances.
Dated 29th Dec. 1852.
329. Jonas Lavater, of No. 17, Grenelle St. Honoré, Paris—Improvements in the apparatus for measuring the inclination of plane surfaces and angles formed or to be formed thereon.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

Date of Registration.	No. in the Register.	Title.	Proprietor's Name.	Address.
Dec. 29	3403	Two-wheeled Vehicle.	David Hawkins	Stratford-on-Avon.